

Amoebic liver abscess

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Abstract

Amoebic liver abscess (ALA) is an uncommon but potentially life-threatening complication of infection with the protozoan parasite *Entamoeba histolytica*. The parasite is transmitted via the fecal-oral route, and once it establishes itself in the colon, it has the propensity to invade the mucosa, leading to ulceration and colitis, and to disseminate to distant extraintestinal sites, the most common of which is the liver. Amoebic liver abscesses (ALA) are the most common extraintestinal site of infection, and occur in fewer than 1% of *E. histolytica* infections. We present the case of a 76-year-old woman with right hypochondrium pain of approximately 3 months who presents in April 2020 at a territorial hospital where after abdominal ultrasound is diagnosed with liver hydatidosis and due to the impossibility of performing a CT, Albendazole 400 mg x 2 / day treatment was initiated. Two months after the consultation in the territory, the patient presents to the Emergency unit "Sf.Spiridon" Hospital Iasi accusing pain in the right hypochondrium with a quasi-permanent character. Exploratory laparoscopy is performed, right subcostal laparotomy extended to the left, viscerolysis, cystectomy and cyst drainage, cyst wall biopsy and inter-hepato-frenic drainage. The bacteriological result shows histolytica entamoeba cysts. About 10% of the world's population is chronically infected with *Entamoeba histolytica*. Amoebiasis is the third commonest parasitic cause of death, surpassed only by malaria and schistosomiasis. The prevalence of infection varies widely, and it occurs most commonly in tropical and subtropical climates. Overcrowding and poor sanitation are the main predisposing factors.

Keywords: *Entamoeba histolytica*; hydatid cyst; protozoan ; parasite; liver abscesses

Introduction

Entamoeba (E.) histolytica is a protozoan parasite belonging to the phylum Sarcomastigophora, subphylum Sarcodina (Rhizopoda), order Amoebida, family Entamoebidae, genus *Entamoeba*. It is the etiologic agent of human amoebiasis, with an incidence of up to 50 million clinical cases per year, including up to 100,000 fatalities. *Entamoeba histolytica* is distributed worldwide among human beings but is also reported to occur in a wide range of New and Old-World monkeys [1]. It is rarely found in domestic animals, including dogs, cats, cattle and captive macropods [2]. Furthermore, guinea pigs and hamsters are susceptible to experimental infection [3].

In human patients, excystation takes place in the large intestine. The trophozoites are usually commensals within the intestinal lumen, reproducing by binary fission and encysting as they move further down the digestive tract. Cysts are shed for many months to years in untreated humans. The cysts remain infective for weeks to months in a moist environment [1].

Amoebic liver abscess is the most frequent extra intestinal manifestation of *Entamoeba histolytica* infection.

This infection is caused by the protozoa *E. histolytica*, which enters the portal venous system from the colon. Amoebic liver abscess is an important cause of space-occupying lesions of the liver, mainly in developing countries [4].

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The parasite is transmitted by the consumption of contaminated drinking water containing cysts. The cyst wall disintegrates in the small intestine, releasing motile trophozoites. These migrate to the large bowel, where pathogenic strains may cause invasive disease. Mucosal invasion results in the formation of flask-shaped ulcers through which amoebae gain access to the portal venous system. The hepatic abscess is usually solitary and affects the right lobe in 80% of cases. The abscess contains sterile pus and reddish-brown liquefied necrotic liver tissue. Amoebae are occasionally present at the periphery of the abscess. The amoebic abscess consists of a wall and a content, the wall is thin, with little fibrous tissue, without the presence of polymorphonuclear cells, with many eosinophils. Around 2% to 5% of patients with intestinal amebiasis may end up with liver abscess [5].

This organism is distributed throughout the world, posing a substantial risk in countries without adequate sanitation of municipal water supplies [6].

For simple abscess, the prognosis is excellent. Complex and large abscesses can rupture and may be associated with a high mortality. Overall, most patients have a favourable outcome with prompt treatment. An amoebic liver abscess may rupture into the chest, abdomen, or pericardium. Rare complications include inferior vena cava thrombosis, hepatic vein thrombosis, intra-abdominal mass.

Patients with amoebic liver abscesses typically present with right upper quadrant (RUQ) pain and fever. The onset of symptoms is usually sub acute. Less than one-third of patients have associated diarrhoea, although some will report a history of dysentery in the prior months. Less than 10% present with jaundice [7].

The diagnosis of an amoebic liver abscess is made through a combination of characteristic findings on imaging and serologic testing. On imaging, there is a cystic intrahepatic cavity that is usually indistinguishable from other causes of liver abscesses. They tend to be round or oval and be variable in size although most are around 2-6 cm in diameter. An enhancing wall is present in most cases. Other described features include an incomplete rim of oedema, the margin of the abscess tends to be smooth in around 60% of cases and nodular in around 40%. Internal septations is present in around 30% of cases and focal intrahepatic biliary dilatation peripheral to an abscess is an uncommon manifestation. Extrahepatic involvement can be present in a considerable proportion of patients, including [pleural effusion](#), [perihepatic fluid collection](#), gastric or colonic involvement and retroperitoneal extension. On ultrasound it will appear as a hypoechoic lesion with low-level internal echoes and absence of significant wall echoes. At computer tomography usually appear as rounded, well-defined lesions with attenuation values that indicate the presence of complex fluid (e.g. 10–20 HU). Most amoebic liver abscesses are solitary lesions, although there can occasionally be multiple lesions, and they are more often found in the right lobe than the left [8].

It may be reasonable to initiate treatment for patients who present with RUQ pain, fever, and have a lesion that is consistent with amoebic liver abscess on imaging, if they have the right epidemiological exposures, before serology testing is completed. Treatment consists of a tissue agent and a luminal agent. The tissue agent of choice is metronidazole, the cure rate for which is >90% [9]. There is no known resistance to metronidazole. Alternatives include tinidazole, ornidazole, and nitazoxanide [10]. The luminal agent is used to remove any intraluminal cysts, even if the stool microscopy is negative. Paromycin is typically used. Alternatives include diiodohydroxyquin or diloxanide furoate.

Materials and methods

We present the case of a 76-year-old woman with right hypochondrium pain for about 3 months; she presented in April 2020 in a territorial hospital where she was diagnosed with hepatic echinococcal cyst and it was initiated the treatment with Albendazole 400 mg x 2 / day. In June 2020, the patient presented to the “St. Spiridon” Hospital Iasi Emergency unit accusing quasi-permanent pain in the right upper quadrant (RUQ), normal hematologic and biochemistry tests.

The preoperative ultrasound found liver steatosis and a cyst approximately 147/80/136 mm with a volume of 851 cc in the segments VI-VII-VIII. Several other liquid formations of 15-16 mm were found in the lower segments. Right kidney with a few parapelvic and cortical cysts of 10-15 mm. Left kidney with similar cysts of 12-13 mm. Normal spleen.

The CT performed at admission described:

- liver with dimensions at the upper limit of normal: right hepatic lobe (RHL) 155 mm, left hepatic lobe (LHL) 54 mm.
- in the segment III, a native isodense lesion, with contrast taking in arterial time, aspect suggestive of hemangioma.
- in RHL, segments VI-VIII there was a lesion with liquid densities, with lobed contour and a fine septum inside, thin wall of approximately 2 mm, with dimensions of 140/84/140 mm.
- at the level of segment III, V (in the vicinity of the one described above) and VIII, other hypoechoic formations with similar characteristics are detected, with a maximum diameter of 10 mm.

Liquid distended gallbladder, without radiopaque stones, thin wall. Normal biliary tract. Permeable normal port venous system. Pancreas, adrenals and spleen with CT appearance within normal limits. Kidneys within normal limits. Variant of right renal vascularization with two renal arteries, emerging from the aorta approximately at the same level. Moderate degenerative-arthritis changes predominantly at the lower ½ of the dorsal and lower lumbar spine. 17 mm diameter T11 vertebra hemangioma.

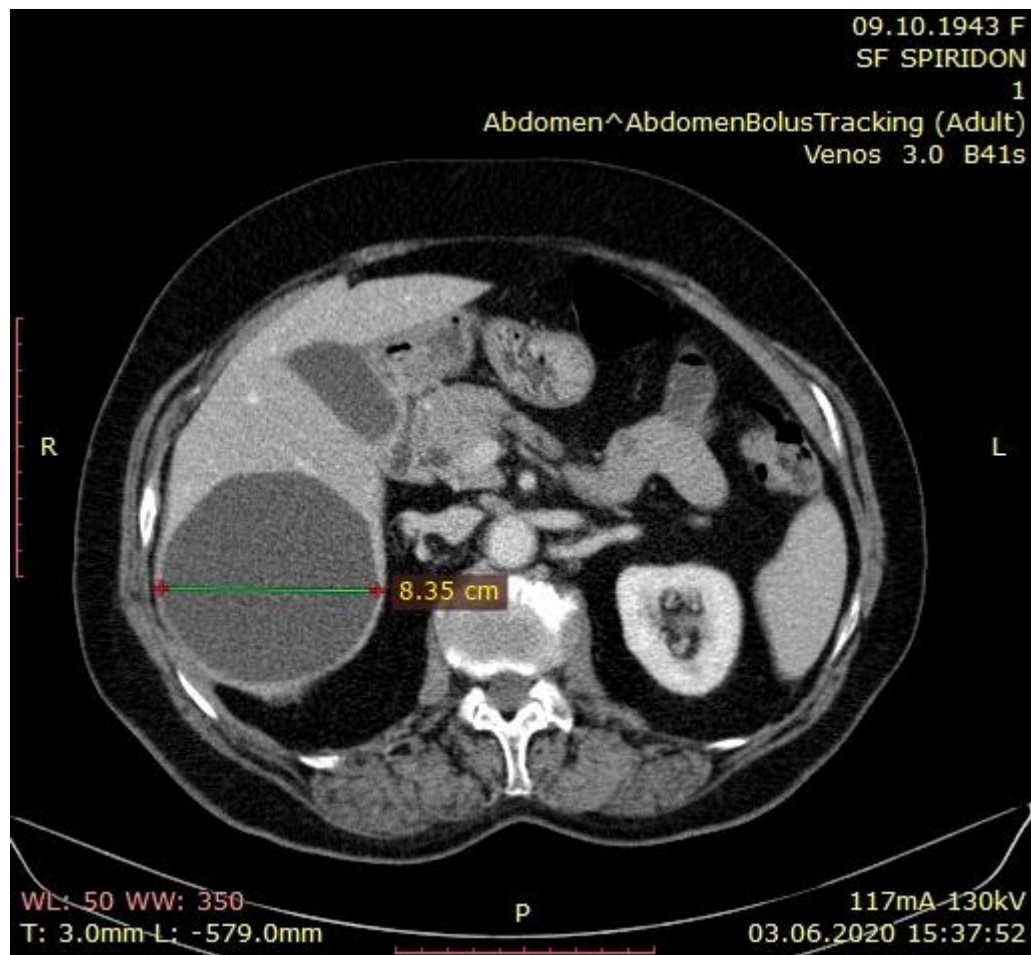


Fig.1. CT- cystic formation hepatic segments VI-VII-VIII

Results

The patient underwent surgery on 16.06.2020: exploratory laparoscopy, right subcostal laparotomy extended to the left, viscerolysis, puncture and evacuation of the cyst, cyst wall biopsy, drainage of the cyst cavity and inter-hepato-phrenic drainage. The surprising anchovy sauce-like pus obtained at the cyst evacuation and the absence of characteristic hydatidic membrane raised intraoperative the suspicion of amoebic etiology of the cyst.

Examination of the cyst content revealed the presence of *Entamoeba histolytica* cysts, prompting Metronidazole postoperative treatment.



Fig.2.a.



Fig.2.b.

Fig.2(a,b). *Entamoeba histolytica* - microscopy

Favorable post-operative evolution, minimal (100ml.) drainage for 2 days, resuming of oral liquid intake the 1st postoperative day and normal feeding the 4th day. The patient has been discharged in the 14th post-operative day.

Discussions

The first information regarding amoebic dysentery in Romania dates back from the period 1868–1869 when 18 cases were recorded in Bucharest [11]. Romania's first autochthonous case of amoebic hepatic abscess had been published in 1976 [12, 13]. Sporadically, there have been reports of complicated amoebic hepatic cysts [14, 15, 16].

Incubation period before development of invasive disease is commonly reported as 4–6 weeks but there are reports of median incubation periods of 128 days [17] and of incubation times of more than 2 years in some cases [18]. Factors determining the development of invasive disease in individuals have not been elucidated [19].

E. histolytica usually colonizes the gastrointestinal tract without producing symptoms. However, up to 1 in 10 patients with an untreated, asymptomatic infection will have invasive disease, usually liver abscesses, within one year [20]. Detection of *E. histolytica* cysts and trophozoites from stool examination has poor sensitivity as trophozoites lose their motility

rapidly after passage of stool and the parasite may be excreted intermittently.

Abdominal pain is the earliest and most frequent complaint, present in almost 100% of the patients. It starts as a feeling of heaviness, and then becomes a sharp pain that increases according to the position of the body, compelling the patient to find relief in bed by turning to the opposite side of the lesion. In abscesses of the right lobe the pain is felt in the right hypochondria, in the right subcostal area or in the cystic point, and may radiate to the shoulder, right side of the neck or the back. In abscesses of the left lobe, the pain is located in the epigastria and left hypochondria and radiates to the left back and left scapular regions.

Besides these prevailing symptoms, patients may also complain of malaise, nausea, vomiting, and anorexia and weight loss. Diarrhea may be present in about 2% of the cases, with 4 to 5 episodes per day of a watery stool, with mucus and blood, tenesmus, abdominal cramping and distension due to potassium loss. In some patients, when diarrhea is absent sigmoidoscopy may show the amoebic ulcers [21]. Jaundice is an unusual feature, reported in only 5% of the cases. Its appearance suggests the existence of large or multiple abscesses, bacterial infection and derangement of hepatic function.

Treatment guidelines for amoebic liver abscesses recommend treating suspected cases empirically, based on history, epidemiology and imaging of an abscess, with a nitroimidazole followed by a luminal amoebicide [22].

Albendazole, a benzimidazole carbamate commonly used for the treatment and control of intestinal helminthic infections, is also useful for the treatment of giardiasis. Therefore, it is of interest to determine whether the drug has activity against other intestinal protozoa, such as *E. histolytica*. The present results demonstrate that albendazole inhibits the growth of *E. histolytica* trophozoites in axenic cultures and induces fine structural changes such as polyribosome aggregation and loss of cytoplasmic vacuoles at concentrations up to 10 micrograms/ml. The viability of *E. histolytica* trophozoites was not affected by the drug [23].

In contrast with the last four decades, when patients with hepatic amebiasis were systematically submitted to surgical drainage by laparotomy, medical therapy nowadays is the treatment of choice, indicating surgical drainage only for extremely large lesions in which ruptures are believed to be imminent [24].

When an interprofessional team approach is undertaken, the prognosis for most patients with an amoebic liver abscess is excellent [25].

In spite of the availability of effective drugs, complications may be found with regularity during the course of hepatic amebiasis. Its appearance depends on the size, number and localization of the lesions, and they may interfere unfavourably with the prognosis of the disease. The spreading of the amoebic lesion to adjoining structures, involving a contiguous mechanism, is a frequently reported complication. Clinically this can result in atelectasis, pleuritis, empyema and pulmonary condensation. These are frequently detected at the right hemithorax, corresponding to lesions of the right lobe of the liver, reported in most cases [26].

To avoid complications like rupture into the lung, pericardium, or abdomen, patients with amoebic liver abscess need a prompt referral to an infectious disease expert for treatment. Current evidence reveals that drainage of complex abscess can improve outcomes as opposed to medical management. Drainage of liver abscesses may be necessary if there is a high risk for rupture or if patients are not responding to drug therapy alone. Antibiotics may also be added in these patients because there is a possibility for bacterial coinfection with amoebic liver abscesses [27]. The mortality rate for amoebic liver abscesses is <1% [28].

Contacts of infected individuals should practice good hand hygiene. There is no available vaccine at this time to protect against *E. histolytica* infection. However, vaccination in animal models have conferred at least partial immunity.

Conclusions

Treatment of all infected cases, whether symptomatic or not, is important for the control of transmission and prevention of disease.

Presentation with liver abscess months after exposure is rare but should be suspected in symptomatic individuals with a relevant history of travel. Improved detection in stool using molecular techniques may reduce the number of complications as a result of earlier disease recognition and appropriate therapy.

Conflict of Interest

Authors have no conflict of interest to disclose.

Patients included in the study were informed in detail about the risks and benefits of each stage of the study investigation and signed specific informed consent. In this research, the fundamental ethical principles of research and the Helsinki Declaration were respected.

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